

CALIFORNIA AVIATION SYSTEM PLAN

SYSTEM REQUIREMENTS ELEMENT



25



California Department of Transportation, December 2003

CALIFORNIA AVIATION SYSTEM PLAN

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Introduction

Preface

This edition of the California Aviation System Plan's System Requirements Element represents a new approach toward planning capacity and capability improvements as well as for achieving safety objectives for the aviation segment of California's Transportation System. It is the position of the Division of Aeronautics that significant latent capacity exists that may be realized through a focus on at least preserving and also enhancing existing infrastructure at the state's 244 General Aviation and Reliever Airports. Additionally, in a time of economic difficulty for the aviation industry, characterized by double digit declines in commercial airline load factors and additional expenses resulting from safety and security measures taken as a result of terrorism concerns, the likelihood that funding will be available in the near future for new large-scale capacity expansion projects seems remote. While these types of projects will need to be implemented, present conditions provide an ideal opportunity to enhance system capacity and improve safety at California's existing facilities with relatively minor additional investment in airport infrastructure improvements.

Purpose of the System Requirements Element

The System Requirements Element is one of ten Elements and Working Papers that make up the California Aviation System Plan (CASP). The CASP is prepared by the California Department of Transportation, Division of Aeronautics and updated every five years per California Public Utilities Code Section 21701, et seq. The law requires the CASP to be developed in consultation with Regional Transportation Planning Agencies (RTPAs) and to be adopted by the California Transportation Commission (CTC). The entire CASP effort also includes and works in concert and is consistent with the following three items:

- Aviation elements of Regional Transportation Plans (RTP), which are prepared by the RTPAs.
- Interregional aviation system plans developed through partnerships that are coordinated by the Division of Aeronautics for regions outside of major metropolitan areas.
- California Transportation Plan, developed in collaboration with transportation policy and decision-makers, transportation providers, and the traveling public.

The primary purpose of the System Requirements Element is to identify and prioritize needed airport capacity and safety related infrastructure enhancements that impact the safety and effectiveness of the California Aviation Transportation System. The emphasis is enhancement projects at facilities the Division of Aeronautics is best suited to impact: General Aviation and Reliever Airports. On average, nearly 80% of all aircraft operations within California are conducted at these types of facilities. The State's Primary Commercial Service airports are discussed only briefly. While their role in serving the majority of air passengers in California's Transportation System is critically significant, the reality is these facilities operate on a scale that allows them to be independent of and seldom even apply for project funding from the Division's four funding programs. In consideration of this truth, the focus of this document is on areas the state's limited financial resources available for airport projects, which are derived solely from General Aviation fuel excise taxes, may best be applied to enhance the California Transportation System. The information used in this document was obtained from existing sources, such as RTP's, Airport Master Plans, FAA 5010 Inventory Master Record documents, Regional Aviation System Plans and other planning documents. The System

Requirements Element is intended to help identify where enhancement needs exist locally and in the overall aviation system-planning picture.

Place of the System Requirements Element in the CASP

The System Requirements Element is to be updated in parallel with the biennial ten year Capital Improvement Plan as logical follow-ups to the CASP's Inventory and Forecast elements. Starting with this edition, the System Requirements Element is to be updated every 2 years in order to more closely link it to the development of the Capital Improvement Plan. The matching of these two documents is important because, while the Capital Improvement Plan is a fiscally unconstrained plan of desired projects based on applications submitted by airports with RTPA concurrence, the System Requirements Element includes a list of potential projects needed to optimize the capacity and safety of California's system of airports, a consideration outside the responsibility of individual airports. Combined, these two elements will serve as a guide toward ensuring state airport project funding is directed toward projects needed at both the statewide system and local levels.

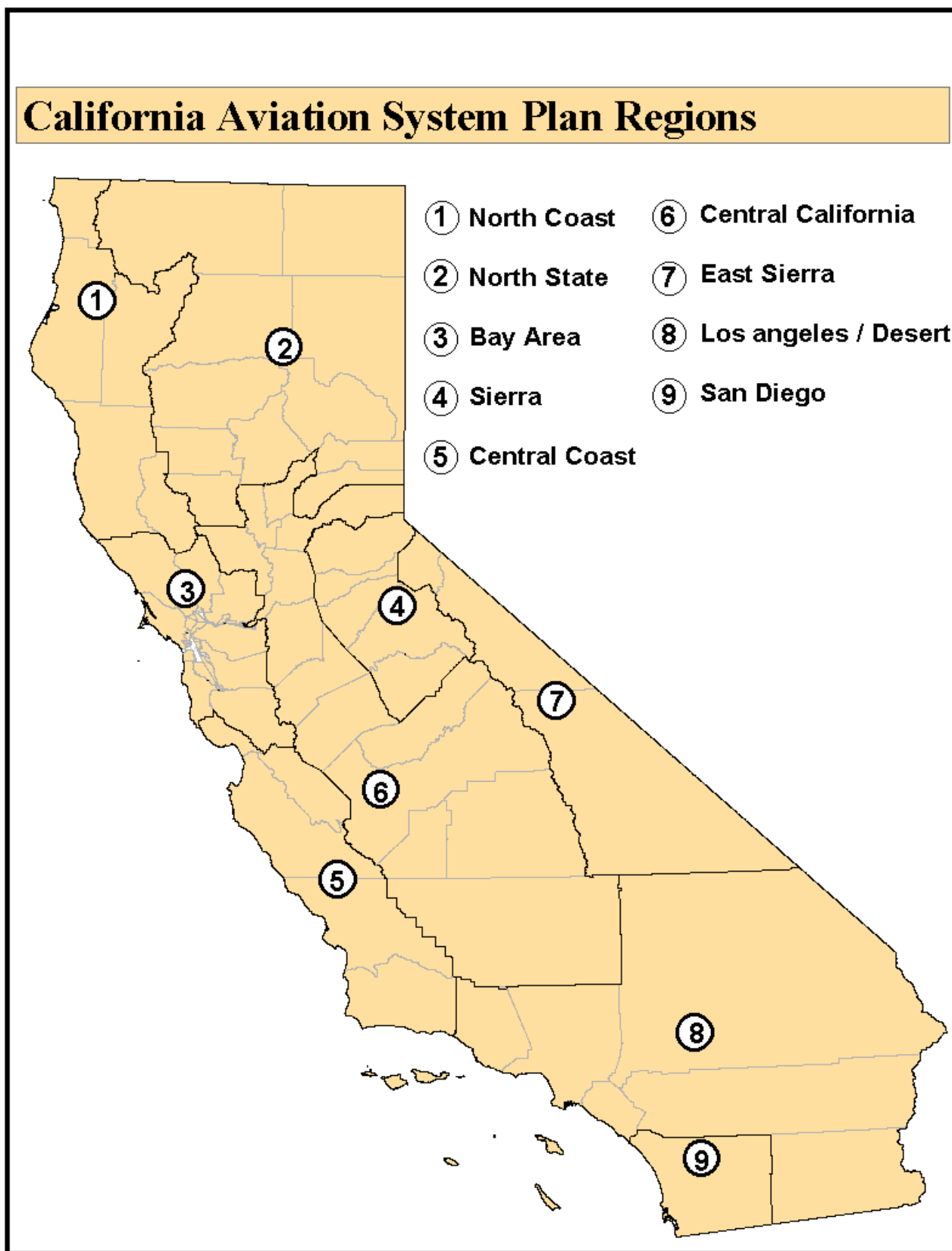
System Requirements Element Format

This element is broken into two sections: Section I: General Aviation & Reliever Airports and Section II: Primary Commercial Service Airports.

"Section I: General Aviation & Reliever Airports" reviews airport functional classifications within the California Aviation System Plan and compares that with the Federal Aviation Administration (FAA)'s National Plan of Integrated Airport Systems (NPIAS). Also presented are state airport permit categories and federal and state airport project funding eligibility. Minimum standards are set based on functional classification descriptions followed by a detailed need identification and analysis for all airports within each of the nine CASP planning regions (see map, page 3). A suggested prioritization schedule of airports with identified projects, based on Capital Improvement Plan criteria but in no particular order, is then provided, followed by a table of enhancements and related cost estimates of identified enhancements.

"Section II: Primary Commercial Service Airports" discusses the State's limited role in planning and programming airport projects for these facilities. Current trends, forecasts, and known and anticipated enhancement needs are portrayed with a focus on the impact of not addressing these needs at General Aviation and Reliever Airports.

MAP 1



Airport Classification

Airports are classified in different ways by different agencies for different purposes. The FAA, in its National Plan of Integrated Airport Systems (NPIAS), identifies airports as General Aviation, Reliever, Commercial Service-Primary Hubs (Large, Medium, or Small), and Other Commercial Service. Not included in the NPIAS for a variety of reasons are a significant number of other airports, any of which are thus solely dependent on state and/or private funding. NPIAS eligibility is described in detail in the glossary.

Another classification system, introduced in the 1998 Inventory Element of the CASP, is still used by the Department to relate how each airport functions in serving the community, region, state, and nation. Military Airports are exempt from the state permitting process and are not eligible for state funding. Therefore, they are not included for consideration in this element. However, it is important to note that these facilities do represent substantial sources of additional capacity should they ever be made available. Additionally, there are two Joint Use Military/Civil airports. While the use of these facilities by civil operators is limited to specific approved uses, the fact that they have been made available in even a limited fashion warrants their discussion in this document. The CASP identifies airports as Limited Use, Community, Regional, Metropolitan, and Commercial/Primary. This distinction between facilities is very useful in most of the Division's system planning activities. However, for this edition of the System Requirements Element it was necessary to establish a stronger link between these functional classes and airport infrastructure requirements, specifically that infrastructure for which the Division can provide project funding.

A matrix illustrating the relationship between NPIAS and CASP airport functional classifications is provided in Table 1 on the following page. Further discussion of airport functional classification is provided in Appendix 1 at the end of this report.

Table 1
Airport Functional Classification Categories and Subcategories

| | |
|---|---|
| FAA NPIAS GENERAL AVIATION-RELIEVER AIRPROTS | <p>LIMITED USE Subcategories – added if LIMITED USE Airport provides a special service Agriculture Firefighting Recreational Access Medical Emergency</p> |
| | <p>COMMUNITY Subcategories – added if COMMUNITY Airport serves one activity Agriculture Firefighting Recreation</p> <p>REGIONAL METROPOLITAN Subcategories – added if REGIONAL or METROPOLITAN Airport serves one activity Business/Corporate Recreation Cargo</p> |
| FAA NPIAS COMMERCIAL- PRIMARY AIRPROTS | <p>COMMERCIAL-REGIONAL COMMERCIAL-METROPOLITAN PRIMARY-(Hub Size)-REGIONAL PRIMARY-(Hub Size)-METROPOLITAN Subcategories – added if one of the above category airports serves one activity Business/Corporate Recreation Cargo</p> |

Connecting Functional Classification and Funding Eligibility

The NPIAS and its associated classifications are important considerations in this element because for an airport to be eligible to receive FAA Airport Improvement Program (AIP) funding, it must be listed in the NPIAS. A key factor necessary to be included in the NPIAS is a requirement that the airport be owned by a public entity. Eligibility for state funding of airport projects is established in the California Aid to Airports Program (CAAP) to be dependent on the issuance of a public use airport permit by the Division of Aeronautics to publicly owned airports. Because airports depend on multiple funding sources for which they are eligible, an important factor to consider in project prioritization at the state level is the funding sources for which each airport is eligible. There are numerous combinations of eligibility criteria that affect the resources available to a given airport. For example, Non-NPIAS public use permitted, public-owned airports are often at a great disadvantage since they are only eligible for state funding, a much smaller pool of funds than federal funding. For this reason, it may be warranted to grant these airports additional consideration for state funding depending on their functional classification and role in the state aviation system.

Establishment and Assignment of Minimum Standards to Functional Classifications

Having established the need for airport infrastructure standards, how best to identify minimum standards and assign them to functional classifications requires understanding the types of projects eligible for state funding and their potential benefits to the system. A research of similar efforts by aviation agencies in other states was initiated and proved quite useful. (Notably, the State of Oregon's Aviation Plan's System Element served as a model for this document.). Table 2A and 2B show the identified minimum standards used in the preparation of this document. Standards were selected with general safety and capacity enhancements in mind, along with airport design categories, with the goal of ensuring that the majority of general aviation aircraft in that category would be able to operate into and out of airports safely and effectively.

Table 2A

| Project Description (in order of priority) | Minimum Standards by Functional Classification | |
|--|--|---|
| | Commercial/Primary Hub | Commercial/Primary Non-Hub or Commercial Service |
| Runway Length/ Extension | 8,000 feet or as provided in Airport Master Plan | 7,000' if below 3,000' MSL or 8,000' if above 3,000' MSL; or as provided in Airport Master Plan |
| Runway Width | 150' | 150' |
| Runway Weight Limit | 60k/single wheel 200k/dual wheel 300k/dual tandem wheel | 50k/single wheel 100k/dual wheel |
| Runway/Approach Lighting | MALS to runway with Precision IFR approach | MALS to runway with Precision IFR approach |
| 24-Hour On-Field Automated Weather (AWOS/ASOS) | 24 hour on-field weather observation | 24 hour on-field weather observation |
| Landing Aids | VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights | VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights |
| Fuel Available | Jet A and Avgas | Jet A and Avgas |

Table 2B

| Project Description (in order of priority) | Minimum Standards by Functional Classification | | | |
|---|--|--|---|---|
| | Metropolitan | Regional | Community | Limited Use |
| Runway Length/ Extension | 5,000' if below 3,000' MSL; 6,000' if above 3,000' MSL; or as provided in Airport Master Plan | Sufficient to accommodate 100% of the aircraft fleet at <i>60% useful load</i> per FAA AC 150/5325-4A Fig. 2-4 | Sufficient to accommodate 100% of the aircraft fleet having <i>10 passenger seats or less</i> per FAA AC 150/5325- 4A Fig. 2-1 | Sufficient to accommodate 75% of the aircraft fleet having <i>10 passenger seats or less</i> per FAA AC 150/5325-4A Fig. 2-1 |
| Runway Width | 100' | 75' | 75' | 60' |
| Runway Weight Limit | 25000/ single wheel | 12,500 single wheel | 12,500 single wheel | 12,500 single wheel |
| Runway/Appch Lighting | MALS to runway with Precision IFR approach | None | None | None |
| 24-Hour On-Field Automated Weather (AWOS/ASOS) | 24 hour on-field weather observation | 24 hour on-field weather observation | 24-hour on-field weather observation if IFR Approach or Part 135 or air ambulance operator on field. | None |
| Landing Aids | VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights | VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights | VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights | None |
| Fuel Available | Jet A and Avgas | 100LL Avgas, & Jet A unless runway length is less than 3,000' | Avgas | None |

The primary consideration in this effort to establish minimum standards was adequate runway length and width to accommodate the majority of representative aircraft likely to use the facility. Special effort was made to relate runway length and width to each facility's unique aircraft performance-limiting characteristics, primarily field elevation and average high temperature, central considerations when calculating a facility's density altitude. As a result, the minimum standard runway length is unique to each airport. At airports without paved runways, it is generally preferable to put pavement down before considering a runway extension. Figures 2-1 and 2-4 from FAA AC 150/5325-4A can be found in the appendices.

In cases where a runway would need to be extended by less than 100 feet to meet that airport's calculated minimum longest runway length, the runway was generally considered to meet minimum standards without an extension.

In many cases, the existing length of an airport's longest runway exceeds its minimum standard length. Though shown in the table as a reference, this comparison is not a recommendation to or justification for shortening a runway.

Enhancement Needs Assessment

Once the standards were assigned, a comprehensive review of each minimum standard category for each airport was initiated. The primary source for this data was the Division's own database of airport data gathered by staff during state permit compliance inspections and FAA 5010-1 Inventory Master Record program inspections (5010-1 is the FAA form used to document airport information at non FAR Part 139 airports). Other data reviewed included airport master plans, airport layout plans, the 1998 CASP Inventory Element, the 1999 CASP Statewide Forecasts Element, and interviews and comments from staff and airport management. From this data, facility enhancement needs were identified. Tables and a brief narrative of the needs assessment are provided in the regional subchapters of Section I.

Enhancement Needs Prioritization

Once identified, these standards needed to have assigned a ranking or weighting based on their net value to the goal of enhancing system capacity and safety. Recognizing an ideal opportunity to link this document to the Capital Improvement Plan (CIP), that document's proposed project prioritization schedule was applied to project types necessary to address identified needs. The 2003 CIP's project prioritization schedule, limited to project types for which airport data was readily available, is reflected in Tables 2A and 2B. As the 2003 CIP has already been adopted, the System Requirements Element is considered an important reference document for airports to consider when submitting projects for future CIP's.

The categories of standards shown on Tables 2A and 2B are the first identified set of project types for which minimums have been identified. It should be noted that the data necessary to thoroughly assess some desired but not included project categories (adjacent land use, clear FAA Part 77 imaginary surfaces, instrument approach procedures) is complex, continuously changing, and not readily available for every airport. Also, though desired, not all projects are eligible for state and/or federal funding. Certainly, there will be additional categories considered in future updates of this document.

Cost Estimates of Needed Enhancements

An unconstrained cost estimate of identified projects is provided for each region except the State's Primary Commercial Service airports. It is necessary to recognize that accurate estimates are difficult to derive without any actual project scoping data that takes into account site-specific considerations. As an example, an estimate may be provided for the cost to extend and widen a runway without taking into account whether or not other infrastructure such as runway lights, taxiways, or hangars would need to be relocated to accommodate this enhancement. Thus it is expected that the total of the estimates provided here understate the actual costs of all projects necessary to accommodate those specified. For most enhancement projects eligible for state funding, an average cost of various potential mitigating projects was determined based on a review of similar projects previously submitted for inclusion in the CIP and consultation with manufacturers and airport managers familiar with the costs associated with recently completed projects. The total estimated cost of the identified enhancement projects comes to \$120.28 million.

Additional Considerations

The majority of recent and projected growth in the general aviation aircraft marketplace has been in the business/personal turbine (turbojet and turboprops) class, with many small jets scheduled to enter service in the near future. Thus runway dimensions were a priority consideration in developing this document. While the current length of several airports' longest runways (35% in the state) already exceeds the minimum standard length, runway extensions are still needed at many General Aviation facilities. In most cases the extensions are possible should the airport sponsor and the community recognize the value air transportation provides. Perhaps even more significant is the impact of widening a runway, an enhancement need common to most California airports. Though an average of 20 feet wider doesn't sound like much, it would run the entire length of the existing runway, meaning that the square footage of most widening projects will exceed that of extensions, and so the cost for material will be higher. Additionally, widening a runway has significant implications for adjacent airport surfaces and equipment: taxiways in many cases would need to be moved in order to maintain minimum separation distances from the runway and runway lighting systems and signage would have to be relocated. None of these additional impacts have been quantified in this report, as they would require project specific study for each airport. Thus the estimated costs shown in the tables are just that: estimates. These estimates are based on current experience with rates for pavement projects, and include some allowance for variations in cost. Finally, there are some facilities where a runway extension or widening is unlikely due to practical considerations such as terrain (such as moving mountains or filling valleys), available land (such as encroachment by development that leaves no room for expansion), and environmental considerations (such as wetlands and/or habitat preservation). For these projects, cost has been categorized as "To Be Determined" (TBD-Terrain; TBD-Land; TBD-Enviro). Still, listing them in this document serves to illustrate this fact and as a basis for considering reclassifying these facilities and their roles in California's aviation system.

While adequate runway dimensions and support features including fuel, weather data, and instrument approach procedures were significant considerations in this process, many airports that do not, and may never, meet minimum classification standards are considered critical due to their location and likely role in the case of emergencies or natural disasters. FAA Advisory Circular 150/5325-4A was the primary resource used to estimate the required minimum runway length. Representative tables from this publication are included in appendices 3 and 4.

It is important to note that inclusion or omission of a particular airport project is not necessarily permanent and does not represent a commitment to complete or prevent said project. In fact, the determining factor on any airport project is the commitment of the airport's sponsor and stakeholders to support or oppose it. This document attempts to identify airports best suited to serve in significant roles at the statewide, regional, and local levels, and the enhancements needed to optimize their functionality within their classifications.

Finally, many apparent issues and conflicts arise out of the fact that many California airports have been in operation since before the current State and Federal standards were adopted. Though significant challenges exist, the goal of supporting projects that bring airports into compliance with modern standards whenever possible is a worthy one. However, while compromising capacity considerations in the interest of safety may be necessary, projects that compromise safety for any reason are unacceptable.